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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,406	07/07/2006	Yasunori Urano	034201.005	2751

441 7590 04/01/2010
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EXAMINER

HAVAN, HUNG T

ART UNIT	PAPER NUMBER
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2128

MAIL DATE	DELIVERY MODE
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04/01/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/585,406	Applicant(s) URANO, YASUNORI	
	Examiner HUNG HAVAN	Art Unit 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>07/07/2006 and 09/11/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-16 are pending in Instant Application.

Priority

2. Examiner acknowledges Applicant's claim to priority benefits of Japanese PCT Applications 2004-004323 and 2004-004342 both filed 01/09/2004.

Information Disclosure Statement

3. The information disclosure statement(s) (IDS) submitted on 07/07/2006 and 09/11/2008 is/are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement(s) is/are being considered by the examiner.

Claim Objections

4. Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Specifically, claim 15 is drawn to a software program and claim 16 which depends on claim 15 is drawn to a storage medium and therefore cannot further limit the steps of the software program.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 15 and 16 are rejected under 35 U.S.C. 101 because the claimed invention is directed

Art Unit: 2128

to non-statutory subject matter.

As per claims 15 and 16, the instant claims are merely directed to claim the computer software program per se. A software program per se do not defined any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. Therefore, the claims are directed to a non-statutory subject matter (see MPEP 2106.01).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being **indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 1, the word "means" is preceded by the word(s) "virtual engine test" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, immediately following the word "means" is the words "for simulating". It is unclear whether the claimed means is "for virtual engine testing" or "for simulating a transition state" and therefore it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. Likewise, "simulation means for simulating" suffers from the same deficiency. The instant claim further recites "virtual control means that emulates actual control means that controls an actual engine" does not properly invoke 35 U.S.C. 112, sixth

Art Unit: 2128

paragraph as a “means or step plus function” construct. Likewise, “control value operation means that supplies a control value” does not properly invoke 35 U.S.C. 112, sixth paragraph as a “means or step plus function” construct. See MPEP 2181.

Additionally, claim 1 recites “... simulation means to be displayed on display means of an operator, ...” It is unclear what constitute “display means of an operator”. The instant claim recites “... the control value operation means comprises means for causing a control value ...” which does not properly invoke 35 U.S.C. 112, sixth paragraph as a “means or step plus function” construct. See MPEP 2181.

As per claim 8, the instant claim recites “a second step of assuming the transition engine model as a virtual engine”. It is unclear who, what or how "assuming" is performed.

As per claim 9, the instant claim recites "control means of an actual engine" which does not properly invoke 35 U.S.C. 112, sixth paragraph as a “means or step plus function” construct. See MPEP 2181.

As per claim 15, the word "means" is preceded by the word(s) "simulation" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, immediately following the word “means” are the words “for simulating behavior of an engine”. It is unclear whether the claimed means is “for simulation” or “for simulating a behavior of an engine” and therefore it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. The instant claim further recites “virtual control means that emulates actual control means that controls an actual engine” which does not properly invoke 35 U.S.C. 112, sixth paragraph as a “means or step plus function” construct. Likewise, “control value operation means that supplies a control value” does not properly invoke 35 U.S.C.

Art Unit: 2128

112, sixth paragraph as a “means or step plus function” construct. See MPEP 2181.

Additionally, claim 15 recites “... simulation means to be displayed on display means of an operator, ...” It is unclear what constitute “display means of an operator”. The instant claim recites “... the control value operation means comprises means for causing a control value ...” which does not properly invoke 35 U.S.C. 112, sixth paragraph as a “means or step plus function” construct. See MPEP 2181.

Furthermore, the preamble of claim 15 recites “[a] computer program that realizes, by being installed on an information processing system:” which is indefinite because it is unclear how a computer program can “realize” (i.e. become aware or made concrete) by the steps of the body of the claim.

There is insufficient antecedent basis in the following claim(s) for the limitation(s) enumerated below:

Claim 9, lacks antecedent basis for "the transition test".

7. The above cited rejections are merely exemplary.
8. The Applicant(s) are respectfully requested to correct all similar errors.
9. Claims not specifically mentioned are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

Art Unit: 2128

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Hagiwara et al* (*US Pub. No. 2001/0023393 A1*) in view of “*A Matlab-Based Modeling and Simulation Package for Electric and Hybrid Electric Vehicle Design*” by *Butler et al* (hereinafter as *Butler et al*).

Hagiwara et al discloses: Claim 1. An engine transition test instrument (i.e. ¶ [0007]) comprising:

virtual engine test means for simulating a transition state in which an engine rotational speed or torque changes with time (i.e. ¶ [0007] and [0008], lines 1-8, teaches a simulator having packages for automatic vehicle transmission controllers, which can simulate non-linear behavior of hydraulic actuators in real time.),

wherein the virtual engine test means comprises

simulation means for simulating behavior of an engine by a transition engine model created (i.e. ¶ [0008], lines 15-20 and ¶ [0034], lines 1-9, teaches first model describing behavior of the engine, second model describing behavior of the transmission) based on data obtained by driving an actual engine while changing a value of at least one controlled factor (i.e. ¶ [0049], lines 1-13 and [0050], lines 1-15, teaches various sensors are provided at the engine including a first rotational speed sensor that generates a signal indicative of the rotational speed of the transmission input shaft. “Driving an actual engine” is broadly interpreted as running an engine under various condition such as different gear ratios as disclosed by the prior art; and not limited to the physical action of a driver and vehicle.);

Art Unit: 2128

virtual control means that emulates actual control means that controls an actual engine, and supplies an engine control signal to the simulation means (i.e. ¶ [0032], lines 1-11 and ¶ [0033], lines 12, teaches the simulator has a group of pseudo-signal generators. The pseudo signals are used to operate the hydraulic actuators such as clutches. Other pseudo signals and the vehicle speed are generated by generators and are input to the simulator main unit); and

control value operation means that supplies a control value for the controlled factor to the virtual control means (i.e. shift control), causes simulation results by the simulation means to be displayed on display means of an operator (i.e. ¶ [0035], lines 1-10, teaches simulator unit performs calculation of outputs of the first to third models and verifies and evaluates the stored shift control algorithm while outputting the results of verification and evaluation through a display), and corrects the control value according to an operation by the operator,

wherein the control value operation means comprises means for causing a control value used for the simulation to be displayed in a time-series graph on the display means along with the simulation results (i.e. Figs. 19A, 19B, and 19C, and ¶ [0093]).

Hagiwara et al does not expressly disclose corrects the control value according to an operation by the operator.

Butler et al, however, teaches corrects the control value according to an operation by the operator (i.e. page 1774, § IV. Simulation Studies, ¶ 1 of section, lines 4-10, teaches engine model and motor model were not fine-tuned to a set of physical components, the simulation results

Art Unit: 2128

have some inaccuracies. The authors design a baseline vehicle and the simulation results are interpreted in comparison to the baseline vehicle.).

Hagiwara et al and Butler et al are analogous art because they are from similar problem solving area of vehicle simulation. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the modeling of different drive cycles as discuss in Butler et al as the engine model in the simulator discussed by Hagiwara et al for the purpose of simulation of controllers or control systems to aid engineers in modifying and optimizing characteristics of controls such as transmission controls (**Hagiwara et al: ¶ [0004], lines 9-13).**

Hagiwara et al discloses: Claim 2. The engine transition test instrument according to claim 1, further comprising:

means for conducting a transition test on actual engine using a control value (**i.e. ¶ [0049], lines 1-13 and [0050], lines 1-15, teaches various sensors are provided at the engine including a first rotational speed sensor that generates a signal indicative of the rotational speed of the transmission input shaft.)** corrected by the control value operation means; and

means for updating a transition engine model in the simulation means based on test results by the means for conducting the transition test.

Butler et al teaches correcting corrected by the control value operation means (**i.e. page 1774, §**

IV. Simulation Studies, ¶ 1 of section, lines 4-10, teaches engine model and motor model

were not fine-tuned to a set of physical components, the simulation results have some inaccuracies. The authors design a baseline vehicle and the simulation results are

interpreted in comparison to the baseline vehicle.); and means for updating a transition engine

Art Unit: 2128

model in the simulation means based on test results by the means for conducting the transition test (i.e. **page 1771, § II. Drive Train Design Methodology, ¶ 1 of section, lines 6-10, and ¶ 3, lines 8-9, teaches user can switch components in and out of a vehicle model and the component models can be created from empirical equations.**).

Hagiwara et al discloses: Claim 3. The engine transition test instrument according to claim 1, wherein the control value operation means updates a control value according to a drag operation by an operator with respect to the control value displayed as a graph on the displaying means (i.e. **Fig. 19A and ¶ [0093], lines 1-7, shows the driveshaft torque TDS a graph**).

Butler et al teaches updates a value according to a drag operation by an operator (i.e. **page 1771, § II. Drive Train Design Methodology, ¶ 3 of section, lines 10-13, and Fig. 2 and Fig 3, teaches a graphical simulation interface which has drag and drop support to connect components and therefore updates a component.**).

Hagiwara et al discloses: Claim 4. The engine transition test instrument according to claim 1, wherein the control value operation means causes a target value for a simulation by the simulation means to be displayed on the display means in parallel with simulation results (i.e. **Fig. 19A and ¶ [0093], lines 1-7, shows the driveshaft torque TDS and the corresponding engine speed Ne on the same graph**).

Hagiwara et al discloses: Claim 5. The engine transition test instrument according to claim 1, wherein with respect to a portion in which the difference between simulation results and a target

Art Unit: 2128

value exceeds a permissible limit, the control value operation means causes the simulation results to be displayed in a display pattern different from that for the other portions (**i.e. Fig. 19A and 19C and ¶ [0094], lines 1-10, teaches the shift control algorithm can be verified and evaluated by changing colors of the lines indicative of the calculated and actual values such that they can be discriminated from each other on the display. Examiner interprets "exceeds a permissible limit" as the portion where actual and simulated values are not the same. These portions would display in two lines, presumably in different colors, as opposed to a single line where the two values match.**).

Hagiwara et al discloses: Claim 6. The engine transition test instrument according to claim 1, wherein with respect to a control value (**i.e. drive shaft torque, TDS**) that corresponds to a portion in which the difference between simulation results and a target value exceeds a permissible limit, the control value operation means causes the control value to be displayed in a display pattern different from that for the other portions (**i.e. Fig. 19A and 19C and ¶ [0094], lines 1-10, teaches the shift control algorithm can be verified and evaluated by changing colors of the lines indicative of the calculated and actual values such that they can be discriminated from each other on the display. Examiner interprets "exceeds a permissible limit" as the portion where actual and simulated values are not the same. These portions would display in two lines, presumably in different colors, as opposed to a single line where the two values match.**).

Art Unit: 2128

Hagiwara et al discloses: Claim 7. The engine transition test instrument according to claim 1, wherein the control value operation means divides the simulation time into time slits of a unit period of time, and causes a time slit in which an integrated value of the difference between simulation results and a target value exceeds a threshold value to be displayed in a display pattern different from that for the other time slits (i.e. ¶ [0083], lines 1-8, [0090], lines 1-14, [0094], lines 1-10 and Fig. 5, teaches 200 μ sec simulation cycle was used. Specifically, the prior art reports “the non-linear clutch section (and the integral factor) was simulated using the same interval of 200 μ sec., the simulation result reveals that the calculated value (marked by “b”) diverged from a desired value (marked by “a”) in the shift control algorithm”. Examiner interprets “exceeds a threshold value” as the portion where actual and simulated values are not the same. These portions would display in two lines, presumably in different colors, as opposed to a single line where the two values match.).

Hagiwara et al discloses: Claim 8. An engine transition test method comprising:

a first step of creating a transition engine model created (i.e. ¶ [0008], lines 15-20 and ¶ [0034], lines 1-9, teaches first model describing behavior of the engine, second model describing behavior of the transmission) based on data obtained by driving an actual engine while changing a value of at least one controlled factor in a transition state in which an engine rotational speed or torque changes with time (i.e. ¶ [0049], lines 1-13 and [0050], lines 1-15, teaches various sensors are provided at the engine including a first rotational speed sensor that generates a signal indicative of the rotational speed of the transmission input shaft. “Driving an actual engine” is broadly interpreted as running an engine under various

Art Unit: 2128

condition such as different gear ratios as disclosed by the prior art; and not limited to the physical action of a driver and vehicle.),

a second step of assuming the transition engine model as a virtual engine, and displaying a control value for the controlled factor for operating the virtual engine (**i.e. Fig 19A**);

a third step of emulating actual control means that controls an actual engine and supplying an engine control signal to the virtual engine based on the control value (**i.e. ¶ [0032], lines 1-11 and ¶ [0033], lines 12, teaches the simulator has a group of pseudo-signal generators. The pseudo signals are used to operate the hydraulic actuators such as clutches. Other pseudo signals and the vehicle speed are generated by generators and are input to the simulator main unit**);

a fourth step of displaying simulation results of operating the virtual engine according to the engine control signal (**i.e. Figs. 19A, 19B, and 19C, and ¶ [0093]**); and

a fifth step of correcting the control value according to the displayed simulation results, wherein the second through the fifth steps are repeated until the simulation results satisfy a performance objective;

in the second step, the control value is displayed in a time-series graph (**i.e. Figs. 19A, 19B, and 19C, and ¶ [0093]**); and

in the fourth step, the simulation results are displayed in parallel with the graph display of the control value (**i.e. Figs. 19A, 19B, and 19C, and ¶ [0093]**).

Hagiwara et al does not expressly disclose correcting the control value according to the displayed simulation results, until the simulation results satisfy a performance objective.

Art Unit: 2128

Butler et al, however, correcting the control value according to the displayed simulation results, until the simulation results satisfy a performance objective (**i.e. page 1774, § IV. Simulation Studies, ¶ 1 of section, lines 4-10, teaches engine model and motor model were not fine-tuned to a set of physical components, the simulation results have some inaccuracies. The authors design a baseline vehicle and the simulation results are interpreted in comparison to the baseline vehicle.**).

Hagiwara et al and Butler et al are analogous art because they are from similar problem solving area of vehicle simulation. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the modeling of different drive cycles as discuss in Butler et al as the engine model in the simulator discussed by Hagiwara et al for the purpose of simulation of controllers or control systems to aid engineers in modifying and optimizing characteristics of controls such as transmission controls (**Hagiwara et al: ¶ [0004], lines 9-13**).

Hagiwara et al discloses: Claim 9. The engine transition test method according to claim 8, further comprising:

a sixth step of providing a control value with which a performance objective has been satisfied by repeating the second through the fifth steps to control means of an actual engine, and conducting an actual transition test on the actual engine (**i.e. ¶ [0049], lines 1-13 and [0050], lines 1-15, teaches various sensors are provided at the engine including a first rotational speed sensor that generates a signal indicative of the rotational speed of the transmission input shaft.**); and

Art Unit: 2128

a seventh step of updating the transition engine model based on results of the transition test, wherein the second through the fifth steps are repeated with the updated transition engine model.

Butler et al, however, teaches updating the transition engine model based on results of the transition test, wherein the second through the fifth steps are repeated with the updated transition engine model (i.e. page 1771, § II. Drive Train Design Methodology, ¶ 1 of section, lines 6-10, and ¶ 3, lines 8-9, teaches user can switch components in and out of a vehicle model and the component models can be created from empirical equations.).

As per claims 10-14, note the rejection of claims 3-7 above. The instant claims recite substantially same limitations as the above-rejected claims and are therefore rejected under same prior-art teachings.

Hagiwara et al discloses: Claim 15. A computer program that realizes, by being installed on an information processing system (see Fig. 1):

simulation means for simulating behavior of an engine by a transition engine model created (i.e. ¶ [0008], lines 15-20 and ¶ [0034], lines 1-9, teaches **first model describing behavior of the engine, second model describing behavior of the transmission**) based on data obtained by driving an actual engine while changing a value of at least one controlled factor (i.e. ¶ [0049], lines 1-13 and [0050], lines 1-15, teaches **various sensors are provided at the engine including a first rotational speed sensor that generates a signal indicative of the rotational speed of the transmission input shaft. “Driving an actual engine” is broadly**

Art Unit: 2128

interpreted as running an engine under various condition such as different gear ratios as disclosed by the prior art; and not limited to the physical action of a driver and vehicle.);

virtual control means that emulates actual control means that controls an actual engine, and supplies an engine control signal to the simulation means (i.e. ¶ [0032], lines 1-11 and ¶ [0033], lines 12, teaches the simulator has a group of pseudo-signal generators. The pseudo signals are used to operate the hydraulic actuators such as clutches. Other pseudo signals and the vehicle speed are generated by generators and are input to the simulator main unit);

control value operation means that supplies a control value for the controlled factor to the virtual control means (i.e. **shift control**), causes simulation results by the simulation means to be displayed on a display screen of an operator (i.e. ¶ [0035], lines 1-10, teaches simulator unit performs calculation of outputs of the first to third models and verifies and evaluates the stored shift control algorithm while outputting the results of verification and evaluation through a display), and corrects the control value according to an operation by the operator; and

means for causing a control value used for the simulation to be displayed in a time-series graph on the display means along with the simulation results (i.e. Figs. 19A, 19B, and 19C, and ¶ [0093]).

Hagiwara et al does not expressly disclose correcting the control value according to the displayed simulation results, until the simulation results satisfy a performance objective.

Butler et al, however, correcting the control value according to the displayed simulation results, until the simulation results satisfy a performance objective (i.e. page 1774, § IV. Simulation Studies, ¶ 1 of section, lines 4-10, teaches engine model and motor model were not fine-

Art Unit: 2128

tuned to a set of physical components, the simulation results have some inaccuracies. The authors design a baseline vehicle and the simulation results are interpreted in comparison to the baseline vehicle.).

Hagiwara et al and Butler et al are analogous art because they are from similar problem solving area of vehicle simulation. At the time of the invention it would have been obvious to person of ordinary skill in the art to utilize the modeling of different drive cycles as discuss in Butler et al as the engine model in the simulator discussed by Hagiwara et al for the purpose of simulation of controllers or control systems to aid engineers in modifying and optimizing characteristics of controls such as transmission controls (**Hagiwara et al: ¶ [0004], lines 9-13**).

Conclusion

11. All claims are rejected.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Havan whose telephone number is (571) 270-7864. The examiner can normally be reached on Monday thru Friday, 9am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available

Art Unit: 2128

through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/HUNG HAVAN/

Examiner, Art Unit 2128

/Hugh Jones/

Primary Examiner, Art Unit 2128